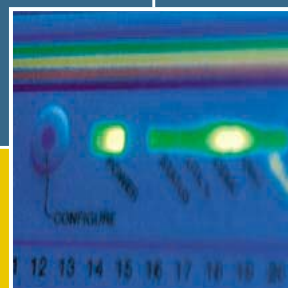
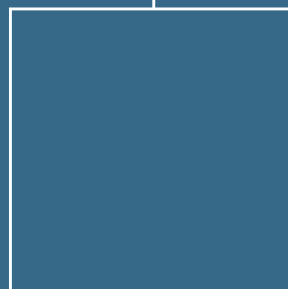


# AT-8700XL SERIES

## USER GUIDE



AT-8700XL Series Switch User Guide for Software Release 2.5.1  
Document Number C613-02030-00 REV A.

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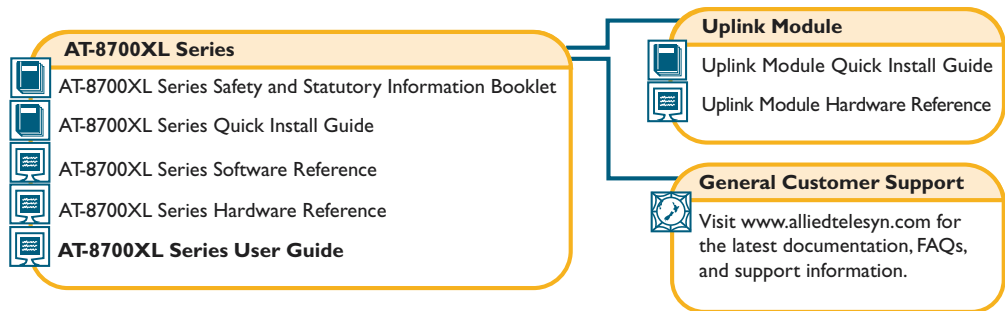
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## Documentation Roadmap



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## Chapter 1

# Introduction

Welcome to the AT-8700XL Series Advanced Fast Ethernet Switch, combining wire speed Layer 2 and Layer 3 switching with Quality of Service (QoS) features such as traffic classifiers and bandwidth limiting.

## Why Read This User Guide?

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This User Guide describes how to get started accessing the switch's Command Line Interface (CLI) and its Graphical User Interface (GUI), and provides an overview of Layer 2 and Layer 3 switching features. For more detailed descriptions of all commands and display outputs see the *AT-8700XL Series Software Reference*. The user guide is organised into the following chapters:

- *Chapter 1, Introduction* introduces the AT-8700XL Series Switch and gives an overview of the features of the AT-8700XL Series Switch and its documentation.
- *Chapter 2, Getting Started* describes how to gain access to the switch's command line and graphical user interfaces.
- *Chapter 3, Operating the Switch* introduces general operation, management and support features, including user authentication, loading and installing support files, and SNMP MIBs.
- *Chapter 4, Layer 2 Switching* describes how to configure Layer 2 switching features, including switch ports, VLANs and STP. A full description of Layer 2 switching is provided in the *AT-8700XL Series Software Reference*.
- *Chapter 5, Maintenance and Troubleshooting* describes some of the commands you can use to monitor the switch and diagnose faults.

## Where To Find More Information

---

Before installing the switch and any expansion options, read the important safety information in the *Safety and Statutory Information* booklet. Follow the *Quick Install Guides* step-by-step instructions for physically installing the switch and its expansion options. The *Hardware References* give detailed information about the equipment hardware. Once you are familiar with the basic operations of the switch, use the *Software Reference* for full command syntax descriptions and for full descriptions of the switch's software routing features.

The latest versions of user documentation for the AT-8700XL family of switches can be downloaded from the on-line support site at <http://www.alliedtelesyn.co.nz/support/at8700xl>. The documentation set for the AT-8700XL Series includes:

- AT-8700XL Series Safety and Statutory Information
- AT-8700XL Series Quick Install Guide
- AT-8700XL Series Documentation and Tools CD-ROM, which includes the following PDF documents:
  - AT-8700XL Series Safety and Statutory Information
  - AT-8700XL Series Quick Install Guide,
  - AT-8700XL Series Hardware Reference
  - AT-8700XL Series Software Reference
  - Uplink Module Quick Install Guide
  - Uplink Module Hardware Reference

## Technical support

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For on-line support for your switch, see our on-line support page at <http://www.alliedtelesyn.co.nz/support/at8700xl>. If you require further assistance, contact your authorised Allied Telesyn distributor or reseller.

The support page will also contain the latest release of the switch software. The LOAD command can be used to download software upgrades directly from the Allied Telesyn web site to the switch's FLASH memory. Use the SET INSTALL command to enable the new software release ("*Example: Install Software Upgrade for AT-8700XL Switch*" on page 20).

## What Can the AT-8700XL Switch Do?

Software support for AT-8700XL Series Switches provides wirespeed Layer 2 and Layer 3 switching, including support for Virtual LANs.

### Switching Features

The main Layer 2 features of the switch are:

- High performance, wire-speed Layer 2 switching (*"Layer 2 Switching"* on page 25).
- Packet Forwarding at wire speed.
- Store and Forward switching mode.
- Autonegotiation of link speed and duplex mode for 10/100 Mbps speed on all 100BASE TX ports (*"Autonegotiation of Port Speed and Duplex Mode"* on page 26).
- Automatic, configurable MAC address learning and ageing, supporting up to 255 static MAC addresses per switch.
- Switch Filtering.
- Layer 3 Filtering (*Switching* chapter in the *AT-8700XL Series Software Reference*).
- Broadcast Storm Protection (*"Packet Storm Protection"* on page 26).
- Virtual LANs defined by port membership (*"Virtual Local Area Networks (VLANs)"* on page 27).
- Spanning Tree Protocol and Rapid Spanning Tree Protocol (*"Spanning Tree Protocol (STP)"* on page 30).
- Classifiers to sort traffic for QoS and hardware filtering
- Quality of Service
  - DSCP configuration enabling management of DiffServ domains
  - Priority queuing
  - Bandwidth limiting
- Port trunking to spread traffic over several links (*"Port Trunking"* on page 26).
- Port mirroring (*"Port Mirroring"* on page 26).
- IP Multicasting
  - Internet Group Management Protocol (IGMP)
  - IGMP snooping
  - IGMP proxy
  - Multicast VLAN Registration

## Routing Features

In addition to Layer 2 and Layer 3 switching, the switch provides a wide array of multiprotocol routing, security and network management features.

Features provided by the routing software suite include:

- IP version 4 routing
- IP version 4 multicasting
- IP RIP
- DNS Relay
- IP Filtering (not between switch ports)
- IP Packet Prioritisation (not between switch ports)
- ARP, Proxy ARP and Inverse ARP address resolution protocols.
- CLI, PAP and CHAP
- Virtual Router Redundancy Protocol (VRRP)
- Telnet client and server.
- A sophisticated and configurable event logging facility for monitoring and alarm notification to single or multiple management centres.
- Triggers for automatic and timed execution of commands in response to events.
- Scripting for automated configuration and centralised management of configurations.
- Dynamic Host Configuration Protocol (DHCP) for automatically assigning IP addresses and other configuration information to PCs and other hosts on TCP/IP networks.
- Support for the Simple Network Management Protocol (SNMP) version 1 and version 2c, standard MIBs and the Allied Telesyn Enterprise MIB, enabling the switch to be managed by a separate SNMP management station.
- An HTTP client that allows files to be downloaded directly from a web server to the switch's FLASH memory, and an HTTP server that serves web pages from FLASH.

For a complete description of the switch's routing software, see the *AT-8700XL Series Software Reference*.



## Chapter 2

# Getting Started

The AT-8700XL Series Switch is supplied with default settings which allow it to operate immediately as a switch, without any configuration. Even if this is all you want to use the switch for, you should still gain access to the switch configuration, if only to change the *manager* password to prevent unauthorised access.

To take advantage of the full range of advanced Layer 2 switching features, the switch configuration must be changed. Layer 3 routing capabilities may also require detailed configuration. The switch has both a Command Line Interface (CLI) and a Graphical User Interface (GUI) for configuration and management. Before you can use the GUI, you will need to log in to the switch and use its CLI to allocate an IP address.

## Simple Switching

---

If all you want the switch to do is switch traffic on your LAN, you need not perform any configuration. Simply power up the switch and connect devices to the switch ports. Switch learning is enabled by default, and all valid packets will be forwarded.

## Command Line Interface

---

The first thing to do after physically installing the switch is to start a terminal session to access the switch. Then you can use the command line interface (CLI) to configure the switch.

You can use a PC running terminal emulation software as the manager console instead of a terminal. Many terminal emulation applications are available for the PC, but the most readily available is the HyperTerminal application included in Microsoft® Windows™ 95, Windows™ 98, and Windows™ 2000. In a normal Windows™ installation HyperTerminal is located in the Accessories group. In Windows™ 2000, HyperTerminal is located in the **Start > Programs > Accessories > Communications** menu.

The key to successfully using terminal emulation software with the switch is to configure the communications parameters in the terminal emulation software to match the default settings of the console port on the switch. For instructions on how to configure HyperTerminal, see the *AT-8700XL Series Hardware Reference*.

To start a terminal session, connect to the switch in one of the following ways:

- Connect a VT100-compatible terminal to the RS-232 Terminal Port, set the communications parameters on the terminal (Table 1 on page 10), and press [Enter] a few times until the switch's login prompt appears; *OR*
- Connect to the COM port of a PC running terminal emulation software such as Windows Terminal or HyperTerminal to the RS-232 Terminal Port, set the communications parameters on the terminal emulation software (Table 1 on page 10), and press [Enter] a few times until the switch's login prompt appears.

**Table 1: Parameters for terminal communication .**

Parameter	Value
Baud rate	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	Hardware

## Logging In and Changing a Password

If you access the switch from a terminal or PC connected to the front panel RS-232 terminal port (asyn0), or via a Telnet connection, you must enter a login name and password to gain access to the command prompt. When the switch is supplied, it has a *manager* account with an initial password *friend*. Enter your login name at the login prompt:

Enter your login name at the login prompt:

```
login: manager
```

Enter the password at the password prompt:

```
password: friend
```

This password should be changed to prevent unauthorised access to the switch, using the command:

```
SET PASSWORD
```

Make sure you remember the new password you create, as a lost password cannot be retrieved, and would mean losing access for configuring and monitoring the switch.

## Giving the Switch an IP Address

Once you have logged into the *manager* account you will be able to enter commands from this document and from the *AT-8700XL Series Software Reference*.

Enable IP, then add an IP interface over the default VLAN (vlan1) and assign it an IP address (e.g. 192.168.1.1), using the commands:

```
ENABLE IP
```

```
ADD IP INTERFACE=vlan1 IPADDRESS=192.168.1.1
```

Once the switch is configured with an IP address, the command line interface can also be accessed by using Telnet to the switch from an IP host.

## Entering Commands

The switch is controlled with commands described in this document and in the *AT-8700XL Series Software Reference*. While the keywords in commands are not case sensitive, the values entered for some parameters are. The switch supports command line editing and recall (Table 2 on page 11).

**Table 2: Command line editing functions and keystrokes**

Function	VT100-compatible Keystroke
Move cursor within command line	←, →
Delete character to left of cursor	[Delete] or [Backspace]
Toggle between insert/overstrike	[Ctrl/O]
Clear command line	[Ctrl/U]
Recall previous command	↑ or [Ctrl/B]
Recall next command	↓ or [Ctrl/F]
Display command history	[Ctrl/C] or SHOW ASYN HISTORY
Clear command history	RESET ASYN HISTORY
Recall matching command	[Tab] or [Ctrl/I]

## The Graphical User Interface (GUI)

The switch may be configured and managed over an available VLAN using the HTTP-based Graphical User Interface (GUI). The GUI may be accessed with Internet Explorer version 5 or greater or Netscape 6.2.2. A copy of Internet Explorer can be found on the switch's Documentation and Tools CD-ROM. JavaScript must be enabled.

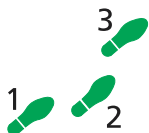


*Use the menus and buttons on the GUI pages to navigate, not your browser's buttons, to ensure that the configuration settings are saved correctly.*

You can optionally browse to the GUI with a Secure Sockets Layer (SSL) connection. This means that sensitive data including passwords and email addresses can not be accessed by malicious parties. For details on configuring a SSL connection for the GUI, refer to the *Secure Sockets Layer (SSL)* chapter in the *AT-8700XL Series Software Reference*.

## Accessing the GUI

You can use any VLAN on the switch to configure it via the GUI. You must first give that VLAN an IP address. In some situations, routing information must also be configured. For more information about IP configuration, see *Chapter 4, Internet Protocol (IP)*. The following instructions show how to configure the switch through vlan1.



### To access the GUI:

1. **Access the switch's command line interface.**

See the switch's *Quick Install Guide* for more information.

2. Enable IP, using the command:

```
ENABLE IP
```

3. Assign the vlan1 interface an IP address in the required subnet, using the command:

```
SET IP INTERFACE=vlan1 IP=ipaddress MASK=mask
```

4. If the PC from which you will access the GUI is on a different subnet to the switch, add a route from the PC to the switch, using the command:

```
ADD IP ROUTE=PC-ipaddress INTERFACE=vlan1  
NEXTHOP=switch-ipaddress
```

5. If you access the Internet through a proxy server, set your browser to bypass the proxy for vlan1's IP address.

6. Point your web browser at vlan1's IP address.

7. At the login prompt, enter the user name and password.

```
User Name: manager
```

```
Password: friend
```

The home page is displayed. Select options to configure and manage the switch.

To change the password, select **Management > Users** from the sidebar menu. Select the Manager account and click **Modify**.

To access the GUI's context-sensitive help system, click on the Help button above the sidebar menu or on the page for which assistance is required.

## Enabling and Disabling the GUI

The GUI is enabled by default. To enable or disable the GUI, use the following commands:

```
ENABLE GUI
```

```
DISABLE GUI
```

When enabled, the GUI will only work if a valid resource file for the hardware model is present in FLASH memory, and if the HTTP server is enabled.

## Getting help

To access the GUI's context-sensitive help system, click on the Help button in the sidebar menu.

## Chapter 3

# Operating the Switch

This chapter introduces general operation, management and support features, including user authentication, loading and installing support files, and SNMP MIBs. For more information see *Chapter 1, Operation* in the *AT-8700XL Series Software Reference*.

## User Privileges

---

The command processor supports three levels of privilege, USER, MANAGER, and SECURITY OFFICER, distinguished by the prompt displayed by the command processor when it is ready to receive commands. A USER level prompt looks like:

>

while a MANAGER prompt looks like:

Manager >

and a SECURITY OFFICER prompt looks like:

SecOff >

See *Chapter 1, Operation* in the *AT-8700XL Series Software Reference* for more information about creating new accounts with user, manager and security officer privileges.

## File Subsystem

---

FLASH memory is structured like a file subsystem. Files can be saved, renamed, listed and deleted. Release files, online help files, configuration scripts and other scripts are all stored as files in FLASH memory.

File names of up to 16 characters long, with extensions of 3 characters (DOS 16.3 format), are supported on the switch. However, files on the switch are **stored** in FLASH and NVS using the DOS 8.3 format of 8 characters long, with extensions of 3 characters. For example, the file `extralongfilename.cfg` may be saved as `extral~1.cfg` in the FLASH File System. Therefore, files can be accessed via two file names, either of which can be used for file management.

A translation table, named `longname.lfn`, converts file names between DOS 16.3 format and DOS 8.3 format. To reconcile file names the switch consults the

translation table which is synchronised with file contents in memory. For more information about working with files see the *Working With Files* section, *Operation* chapter, *AT-8700XL Series Software Reference*.

To display the files in FLASH, use the command:

```
SHOW FILE
```

The switch automatically compacts FLASH memory when a maximum threshold of deleted files is reached. Compaction frees space for new files by discarding garbage. A message will appear when FLASH compaction has been activated. Another message appears when FLASH compaction is complete.



---

*While FLASH is compacting, do not restart the switch or use any commands that affect the FLASH file subsystem. Do not restart the switch, or create, edit, load, rename or delete any files until a message confirms that FLASH file compaction is completed. Interrupting flash compaction may result in damage to files.*

---

## Online CLI Help

---

Online help is available for all switch commands in the CLI. Typing a question mark "?" at the end of a partially completed command displays a list of the parameters that may follow the current command line, with the minimum abbreviations in uppercase letters. The current command line is then re-displayed, ready for further input.

An online help facility provides more detailed help information via the command:

```
HELP [topic]
```

If a topic is not specified, a list of available topics is displayed. The HELP command displays information from the system help file stored in FLASH memory. The help file used by the HELP command must be defined using the command:

```
SET HELP=helpfile
```

The current help file and other system information can be displayed with the command:

```
SHOW SYSTEM
```

## Configuration Scripts

---

At boot the switch executes the commands in the boot script to configure the switch. A boot script is a sequence of standard commands that the switch executes at start-up. The default boot script is called `boot.cfg`, but an alternative script file can be defined as the boot script using the command:

```
SET CONFIG=filename
```

A configuration file is a script made up of the same commands as are used in the CLI. It can be edited manually using the switch's built in editor, or uploaded to a PC and edited using any text editor using the UPLOAD command (*Chapter 1, Operation* in the *AT-8700XL Series Software Reference*).

## Saving Configuration Entered with the GUI

Configuration changes applied using the GUI can be saved to a configuration script by clicking the Save button on any GUI page that has one. A pop-up Save window gives the option of saving to the boot configuration file, the current configuration file, another existing file or a new file.

## Saving Configuration Entered with the CLI

Subsequent commands entered from the command line or executed from a script affect only the dynamic configuration in memory, which is not retained over a power cycle. Changes are not automatically stored in nonvolatile memory. When the switch is restarted the configuration will be restored to that defined by the boot script, or if the switch was restarted using the RESTART command, any script specified in the RESTART command.

To retain any configuration changes made after boot across a restart or power cycle, save the modified configuration as a script file, using the command:

```
CREATE CONFIG=filename
```



---

*The configuration file created by the GUI or the CREATE CONFIG command records passwords in encrypted form, not in cleartext.*

---

## Install Information

---

When you first start the switch, it automatically loads the software release from FLASH memory into RAM, where the CPU uses it to run all the switch's software features. The switch may also load a patch file to improve the main release. The software release and any patch files are current when the switch is produced at the factory.

When Allied Telesyn makes a new patch or release available, you may want to upgrade the software on your switch to use a new patch or release file. You can download the latest software patches, full software releases, and CLI help files from the support site at: <http://www.alliedtelesyn.co.nz/support/at8700xl>.

The INSTALL module is responsible for maintaining install information and loading the correct install at boot. A release is a binary file containing the code

executed by the switches CPU. There may also be a patch file, and additional binary file that modifies the original release file. An *install* is a record identifying a release and an optional patch. Three installs are maintained by the INSTALL module, *temporary*, *preferred* and *default*.

The default install is the install of last resort. The release for the default install can not be changed by the manager and is always the EPROM release. The patch for the default install may be set by the manager.

The temporary and preferred installs are completely configurable. Both the release and an associated patch may be set. The release may be EPROM or a release stored in FLASH.

The three different installs are required to handle the following situations:

- A default install is required to handle the case when only the EPROM release is present.
- A temporary install is required to allow a release and/or patch to be loaded once only, in case it causes a switch crash.
- A preferred install is required because the default install can not be anything other than the EPROM.

The install information is inspected in a strict order. The temporary install is inspected first. If this install information is present, the temporary install is loaded. At the same time, the temporary install information is deleted. This ensures that if the switch reboots immediately as the result of a fatal condition caused by the temporary install, the temporary install will not be loaded a second time.

If there is no temporary install defined, or the install information is invalid, the preferred install is inspected. If present, this install is loaded. The preferred install information is never deleted.

If neither temporary nor preferred installs are present, the default install is used. The default install will always be present in the switch, because if, for some reason, it is not, the INSTALL module will restore it.



---

*The preferred install should not be set up with an untested release or patch. It is advisable to install new releases or patches as the temporary install, and when the switch boots correctly, to then set up the preferred install with the new release or patch.*

---

To change the install information in the switch, use the command:

```
SET INSTALL={TEMPORARY|PREFERRED|DEFAULT}  
[RELEASE={release-name|EPROM}] [PATCH[=patch-name]]
```

The INSTALL parameter specifies which install is to be set. The INSTALL module is responsible for maintaining install information and loading the correct install at boot. An *install* is a record identifying a release and an optional patch. Three installs are maintained by the INSTALL module, *temporary*, *preferred* and *default*.

The default install is the install of last resort. The release for the default install can not be changed by the manager and is always the EPROM release. The patch for the default install may be set by the manager.



The temporary and preferred installs are completely configurable. Both the release and an associated patch may be set. The release may be EPROM or a release stored in FFS.

The RELEASE parameter specifies the release file for this install. The release file is either a file name of the form `device:filename.ext` for files in the file subsystem, or EPROM, to indicate the EPROM release. The default value for the device field is FLASH.

The PATCH parameter specifies the patch file for this install, and is a file name of the form `device:filename.ext`. The patch file is stored in FLASH. The default value for the device field is FLASH. If the patch name is not given, the patch file information for a given install is removed and only the release file will be loaded for the install.

A patch file can not be set up for an install unless a release file is already set up, or a release file is specified in the same command. This stops the inadvertent setting of an install to be just a patch file. When the switch reboots in such a case the particular install is ignored, which may have undesirable effects on the switch operation.




---

*For security reasons this command will only be accepted if the user has SECURITY OFFICER privilege.*

---

To delete a particular install (except the default install) use the command:

```
DELETE INSTALL
```

To display the current install information, including which install is currently running in the switch, and how the install information was checked at the last reboot, use the command:

```
SHOW INSTALL
```

## Loading Releases and Patches into the Switch

The LOADER module is responsible for loading and storing releases, patches and other files into FLASH. The LOADER module uses the *Trivial File Transfer Protocol* (TFTP), *Hypertext Transfer Protocol* (HTTP) or ZMODEM over an asynchronous port, to retrieve files from a network host. The FFS module is used to create, write and destroy release and patch files.

The loader can be configured with the command:

```
SET LOADER [DELAY=delay|DEFAULT]
[DESTINATION={FLASH|DEFAULT}] [FILE=filename]
[HTTPPROXY={hostname|ipadd|DEFAULT}]
[METHOD={HTTP|TFTP|WEB|WWW|ZMODEM|NONE|DEFAULT}]
[ASYN=port|DEFAULT] [PROXYPORT=1..65535|DEFAULT]
[SERVER={hostname|ipadd|DEFAULT}]
```

This command sets default values for the name of the file to load, the network host to load it from, and the memory location in which to store the file. These default values can be overridden when the load actually takes place. A time delay between initiating a load and the start of the load can also be configured.

The DELAY parameter specifies the delay, in seconds, between initiating the file download and the download actually starting. This feature is provided to allow reconfiguration of ports and devices after initiating the download. For example, a manager may be at a remote site with a single PC which is to act as both the access device to the switch and the TFTP server. By specifying a delay, the manager has time to reconfigure the PC from terminal emulation mode to TFTP server mode before the download starts. The DELAY parameter is optional. If DEFAULT is specified, this parameter is set to the factory default, which is no delay.

The DESTINATION parameter specifies where the file will be stored. If FLASH is specified, the file is stored in the FLASH File System (FFS) on the switch. If DEFAULT is specified, this parameter is set to the factory default, FLASH.

The FILE parameter specifies the name of the file, in the syntax of the server from which the file will be downloaded. The FILE parameter is a full path name rather than just a file name. The only restriction is that the last part of the parameter must be a valid file name for the LOADER module. When METHOD is set to TFTP, HTTP, ZMODEM or NONE, valid file names are of the form filename.ext where filename is one to sixteen characters in length and ext is three characters in length. The following are examples of valid file names for methods TFTP, ZMODEM or NONE:

```
\user\public\filename.ext ; UNIX or DOS server  
[network.cfg]filename.ext ; DEC VAX server
```

Note that, starting at the end of the file name and working backwards, the first character not valid in file names delimits a valid file name for the switch. If the slash at the beginning of the path is omitted in this command, the LOAD command adds it. The following are examples of valid file names for method HTTP:

```
/path/filename.ext  
path/filename.ext
```

The HTTPPROXY parameter specifies the proxy server used to handle HTTP requests. Either the IP address or the fully qualified domain name of the proxy server may be specified. If a domain name is specified, the switch will perform a DNS lookup to resolve the name. If DEFAULT is specified, this parameter is set to the factory default, which has no value set for HTTPPROXY, clearing any value previously set as default.

The METHOD parameter specifies the method to use when downloading the file. If HTTP is specified, HTTP is used to download the file. The options WEB and WWW are synonyms for HTTP. If TFTP is specified, TFTP is used to download the file. If ZMODEM is specified, the ZMODEM protocol is used to download the file. If ZMODEM is specified, the PORT parameter must be specified, unless it has been set with the SET LOADER command. If NONE is specified, only text files can be downloaded and all input received via the port will be directed to the specified file on the switch's file subsystem. The file transfer is terminated by the first control character received that is not a CR or LF character. The FILE parameter is not valid when METHOD is set to ZMODEM. The PORT parameter is not valid when METHOD is set to HTTP, WEB, WWW, TFTP or NONE. If DEFAULT is specified, this parameter is set to the factory default, which is TFTP.

The ASYN parameter specifies the asynchronous port via which the file will be downloaded, when the METHOD parameter is set to ZMODEM or NONE. If METHOD is set to ZMODEM or NONE, the PORT parameter is required unless it has been set with the SET LOADER command. If DEFAULT is

specified, this parameter is set to the factory default, which is no PORT set, clearing any value previously set as default.

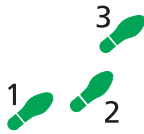
The PROXYPORT parameter specifies the port on a proxy server. The PROXYPORT parameter is only valid if METHOD is HTTP and HTTPPROXY is specified. If DEFAULT is specified, this parameter is set to the factory default, which is 80.

The SERVER parameter specifies the IP address or the host name (a fully qualified domain name) of the TFTP server or HTTP server from which the file is loaded. If a host name is specified, a DNS lookup is used to translate this to an IP address. The SET IP NAMESERVER command can be used to define name servers. The PING command can be used to verify that the switch can communicate with the server via IP. The SERVER parameter is not used when METHOD is set to ZMODEM or NONE. The following are examples of valid server names when METHOD is set to HTTP:

```
host.company.com
192.168.3.4
```

If DEFAULT is specified, this parameter is set to the factory default, which has no value set for SERVER, clearing any value previously set as default.

## Loading a release file into the switch



### To upgrade the software release on the switch

#### 1. Check the release files on the switch.

In the switch's command line, enter the command:

```
SHOW FFILE
```

This command lists the files which are present on the router, and the amount of free memory. Identify the existing release files, which will have an extension of `.rez`.

#### 2. Load the new release file.

For example, to load the file from a TFTP server, enter the command:

```
LOAD FILE=filename.rez SERVER=tftp-ip
```

where *filename.rez* is the name of the new release file, and *tftp-ip* is the IP address of the TFTP server. If you are running AT-TFTP Server 1.8 on your PC, the IP address is the IP address of the PC.

#### 3. Enable the new release.

For a free minor release upgrade (for example `87-251.rez` to `87-252.rez`), enter the command:

```
ENABLE RELEASE=filename.rez NUMBER=number
```

where *number* is the new software release number, for example `2.5.2`.

For a major release upgrade, enter the command:

```
ENABLE RELEASE=filename.rez NUMBER=number
PASSWORD=password
```

where *password* is the password supplied by your authorised distributor or reseller, and is specific to a particular release and switch serial number.

#### 4. Set the switch to boot up with the new release file.

Enter the command:

```
SET INSTALL=PREFERRED RELEASE=filename.rez
```

where *filename.rez* is the name of the new release file.

#### 5. Reboot the switch.

Enter the command:

```
RESTART REBOOT
```

If you are using the GUI, you will lose your browser's connection to the switch. Wait for the router to reboot, or browse to the switch's IP address.

#### 6. Check the release.

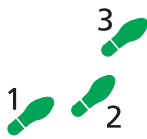
Check that the new software release runs as expected. To confirm that the switch is running the new release, enter the command:

```
SHOW INSTALL
```

The *Current install* section in the output from this command should show the new software release as the preferred release.

## Example: Install Software Upgrade for AT-8700XL Switch

This example downloads a compressed release from the AT-8700XL Support site to the switch's FLASH memory using TFTP.



#### To install a compressed release:

##### 1. Download the release files to the switch.

Load the file from your TFTP server to the switch, using the command:

```
LOAD FILE=87-251.rez SERVER=tftp-ip
```

where *tftp-ip* is the IP address of your TFTP server. If you are running AT-TFTP server on a PC, this is the PC's IP address.

If you do not have a TFTP server, AT-TFTP Server 1.8 is available on the Documentation and Tools CD.

The process of downloading a release file can take some time, even if the switch and the TFTP server are connected by high speed links. An indicative time for downloading a release over Ethernet is 5 to 10 minutes. The progress of the download can be monitored with the command:

```
SHOW LOAD
```

When the download has completed, the presence of the files in FLASH can be displayed with the command:

```
SHOW FILE
```

This shows the file 87-251.rez is present.

## 2. Enable the new release.

The release can now be enabled, using the command:

```
ENABLE RELEASE=87-251.REZ NUMBER=2.5.1
```

## 3. Make the release the default (permanent) release.

Set the switch to boot up using the new release, and then restart it.

```
SET INSTALL=PREFERRED RELEASE=87-251.REZ
```

Every time the switch reboots from now on, the new release will be loaded from FLASH.

Other load methods are described in the *Operations* chapter in the *AT-8700XL Series Software Reference*.

# Upgrading and Storing GUI Resource Files

You can store two GUI resource files in the switch's memory, and set the GUI resource file that you want to use. To load a GUI resource file, use the command:

```
LOAD FILE=filename.rsc SERVER=server
```

where:

- *filename* is the name of the GUI resource file
- *server* is the server used to load the file.

To set a GUI resource file as the preferred resource file, use the command:

```
SET INSTALL=preferred GUI=filename.rsc
```

where:

- *filename* is the name of the GUI resource file

The GUI resource file name must conform to the convention *tpplvv.rsc*, for example, *r\_410e05.rsc*, where:

- *t* = GUI type
- *ppp* = product code
- *l* = language code
- *vv* = version number
- *.rsc* = resource file extension

The resource file must exist in FLASH, possess a valid checksum, be compatible with the product model it is being loaded onto, and be compatible with the current software release. By specifying a null string for filename, i.e. "SET INSTALL=preferred GUI=", no resource file will be used, and therefore the GUI will be unavailable. The GUI is also unavailable if the command "SET INSTALL=preferred GUI=none" is entered.

If the selected GUI resource file fails to pass the validation checks when it is loaded, the given install will not fail. Instead, the release and patch files are loaded, but the GUI resource file is not loaded. The success or failure of this validation is recorded in the “install history” section of the SHOW COMMAND.



*Changing the resource file will cause an implicit RESET GUI to be performed. The switch will reinitialise and reconstruct its index of pointers into the resource file so that the new GUI resource file is accessed correctly.*

To delete a GUI resource file from the switch, you must first ensure that it is not the preferred release file. Use the command:

```
SET INSTALL=preferred GUI=none
```

When the GUI resource file that you want to delete is no longer set as the preferred GUI, you can delete the .rsc file using the command:

```
DELETE FILE=filename.rsc
```

## SNMP and MIBs

The switch’s implementation of SNMP is based on RFC 1157 “A Simple Network Management Protocol (SNMP)”, and RFC 1812, “Requirements for IP Version 4 Routers”. The switch supports SNMP version 1 (SNMPv1) and SNMP version 2c (SNMPv2c). The SNMP agent is disabled by default. To enable SNMP, use the command:

```
ENABLE SNMP
```

SNMP *communities* are the main configuration item in the switch’s SNMP agent, and are defined in terms of a list of IP addresses which define the SNMP application entities (trap hosts and management stations) in the community. An SNMP community is created using the command:

```
CREATE SNMP COMMUNITY=name [ACCESS={READ|WRITE}]
[TRAPHOST=ipadd] [MANAGER=ipadd]
[OPEN={ON|OFF|YES|NO|TRUE|FALSE}] [V1TRAPHOST=ipadd]
[V2CTRAHOST=ipadd]
```

Authentication failure traps and link state traps can be enabled using the commands:

```
ENABLE SNMP AUTHENTICATE_TRAP
ENABLE INTERFACE=interface LINKTRAP
```

where *interface* is the name of an interface, such as vlan11.

The command:

```
SHOW SNMP
```

displays the current state and configuration of the SNMP agent.

The following MIBs are supported:

- MIB II (RFC 1213)
- Ethernet MIB (RFC 1643)
- Trap MIB (RFC 1215)

- RMON Groups 1, 2, 3, and 9 (RFC 1757)
- AR Router portion of the ATI/ATKK Enterprise MIB
- Portions of the Extended Interface MIB (RFC 1573)

For details on SNMP, refer to the *SNMP* chapter in the *AT-8700XL Series Software Reference*.





## Chapter 4

# Layer 2 Switching

This section outlines the Layer 2 switching features on the switch, and how to configure some of them. For more detail, refer to the *Switching* chapter in the *AT-8700XL Series Switch Software Reference*.

## Switch Ports

---

Each switch port is uniquely identified by a port number. The switch supports a number of features at the physical level that allow it to be connected in a variety of physical networks. This physical layer (layer 1) versatility includes:

- Enabling and disabling of ports.
- Auto negotiation of port speed and duplex mode for all 10/100 BASE ports.
- Manual setting of port speed and duplex mode for all 10/100 BASE ports.
- Link up and link down triggers.
- Port trunking.
- Packet storm protection.
- Port mirroring.
- Support for SNMP management

## Enabling and Disabling Switch Ports

An switch port that is enabled is available for packet reception and transmission. Its administrative status in the Interfaces MIB is UP. Disabling a switch port does not affect the STP operation on the port. Enabling a switch port will allow the port to participate in spanning tree negotiation. A switch port that has been disabled by the Port Security feature cannot be enabled using the ENABLE SWITCH PORT command.

To enable or disable a switch port, use the commands:

```
ENABLE SWITCH PORT={port-list|ALL}
```

```
DISABLE SWITCH PORT={port-list|ALL}
```

Resetting ports at the hardware level discards all frames queued for reception or transmission on the port, and restarts autonegotiation of port speed and duplex mode. Ports are reset using the command:

```
RESET SWITCH PORT={port-list|ALL} [COUNTER]
```

To display information about switch ports, use the command:

```
SHOW SWITCH PORT [= {port-list | ALL}]
```

## Autonegotiation of Port Speed and Duplex Mode

Each of the switch ports can operate at either 10 Mbps or 100 Mbps, in either full duplex or half duplex mode. In full duplex mode a port can transmit and receive data simultaneously, while in half duplex mode the port can either transmit or receive, but not at the same time. This versatility makes it possible to connect devices with different speeds and duplex modes to different ports on the switch. Such versatility also requires that each port on the switch know which speed and mode to use.

## Port Trunking

Port trunking, also known as port bundling or link aggregation, allows a number of ports to be configured to join together to make a single logical connection of higher bandwidth. This can be used where a higher performance link is required, and makes links even more reliable.

## Packet Storm Protection

The packet storm protection feature allows you to set limits on the reception rate of broadcast, multicast and destination lookup failure packets. The software allows separate limits to be set for each port, beyond which each of the different packet types are discarded. The software also allows separate limits to be set for each of the packet types. Which of these options can be implemented depends on the model of switch hardware.

## Port Mirroring

Port mirroring allows traffic being received and transmitted on a switch port to be sent to another switch port, the mirror port, usually for the purposes of capturing the data with a protocol analyser. This mirror port is the only switch port which belongs to no VLANs, and therefore does not participate in any other switching. Before the mirror port can be set, it must be removed from all VLANs except the default VLAN. The port cannot be part of a trunk group.

## Port Security

The port security feature allows control over the stations connected to each switch port, by MAC address. If enabled on a port, the switch will learn MAC addresses up to a user-defined limit from 1 to 256, then lock out all other MAC addresses. One of the following options can be specified for the action taken when an unknown MAC address is detected on a locked port:

- Discard the packet and take no further action,
- Discard the packet and notify management with an SNMP trap,
- Discard the packet, notify management with an SNMP trap and disable the port.

## Virtual Local Area Networks (VLANs)

---

A Virtual LAN (VLAN) is a logical, software-defined subnetwork. It allows similar devices on the network to be grouped together into one broadcast domain, irrespective of their physical position in the network. Multiple VLANs can be used to group workstations, servers, and other network equipment connected to the switch, according to similar data and security requirements.

Decoupling logical broadcast domains from the physical wiring topology offers several advantages, including the ability to:

- Move devices and people with minimal, or no, reconfiguration
- Change a device's broadcast domain and access to resources without physically moving the device, by software reconfiguration or by moving its cable from one switch port to another
- Isolate parts of the network from other parts, by placing them in different VLANs
- Share servers and other network resources without losing data isolation or security
- Direct broadcast traffic to only those devices which need to receive it, to reduce traffic across the network
- Connect 802.1Q-compatible switches together through one port on each switch

Devices that are members of the same VLAN only exchange data with each other through the switch's switching capabilities. To exchange data between devices in separate VLANs, the switch's routing capabilities are used. The switch passes VLAN status information, indicating whether a VLAN is up or down, to the Internet Protocol (IP) module. IP uses this information to determine route availability.

The switch has a maximum of 255 VLANs, ranging from a VLAN identifier (VID) of 1 to 255. When the switch is first powered up, a "default" VLAN is created and all ports are added to it. In this initial unconfigured state, the switch will broadcast all the packets it receives to the default VLAN. This VLAN has a VID of 1 and an interface name of `vlan1`. It cannot be deleted, and ports can only be removed from it if they also belong to at least one other VLAN. The default VLAN cannot be added to any STP, but always belongs to the default STP. If all the devices on the physical LAN are to belong to the same logical LAN, that is, the same broadcast domain, then the default settings will be acceptable, and no additional VLAN configuration is required.

### Creating VLANs

To briefly summarise the process of creating a VLAN:

1. Create the VLAN.
2. Add tagged ports to the VLAN, if required.
3. Add untagged ports to the VLAN, if required.

To create a VLAN, use the command:

```
CREATE VLAN=vlan-name VID=2..255
```

Every port must belong to a VLAN, unless it is the mirror port. By default, all ports belong to the default VLAN as untagged ports.

To add tagged ports to a VLAN, use the command:

```
ADD VLAN={vlan-name|1..255} PORT={port-list|ALL} FRAME=TAGGED
```

A port can be tagged for any number of VLANs.

To add untagged ports to a VLAN, use the command:

```
ADD VLAN={vlan-name|1..255} PORT={port-list|ALL}  
[FRAME=UNTAGGED]
```

A port can be untagged for zero or one VLAN. A port can only be added to the default VLAN as an untagged port if it is not untagged for another VLAN. A port cannot transmit both tagged and untagged frames for the same VLAN (that is, it cannot be added to a VLAN as both a tagged and an untagged port).

To remove ports from a VLAN, use the command:

```
DELETE VLAN={vlan-name|1..255} PORT={port-list|ALL}
```

Removing an untagged port from a VLAN will return it to the default VLAN, unless it is a tagged port for another static VLAN. An untagged port can only be deleted from the default VLAN if the port is a tagged port for another static VLAN.



---

*Ports tagged for some VLANs and left in the default VLAN as untagged ports will transmit broadcast traffic for the default VLAN. If this is not required, the unnecessary traffic in the switch can be reduced by deleting those ports from the default VLAN.*

---

To change the tagging status of a port in a VLAN, use the command:

```
SET VLAN={vlan-name|1..255} PORT={port-list|ALL} FRAME=TAGGED
```

To destroy a VLAN, use the command:

```
DESTROY VLAN={vlan-name|1..255|ALL}
```

VLANs can only be destroyed if no ports belong to them.

To display the VLANs configured on the switch, use the command:

```
SHOW VLAN [= {vlan-name|1..255|ALL}]
```

Information which may be useful for trouble-shooting a network can be displayed with the VLAN debugging mode. This is disabled by default, and can be enabled for a specified time, disabled, and displayed using the commands:

```
ENABLE VLAN={vlan-name|1..255|ALL} DEBUG={PKT|ALL}  
[OUTPUT=CONSOLE] [TIMEOUT={1..400000000|NONE}]  
DISABLE VLAN={vlan-name|1..255|ALL} DEBUG={PKT|ALL}  
SHOW VLAN DEBUG
```

To view packet reception and transmission counters for a VLAN, use the command (see the *Interfaces* chapter of the switch's Software Reference):

```
SHOW INTERFACE=VLANn COUNTER
```

## Summary of VLAN tagging rules

When designing a VLAN and adding ports to VLANs, the following rules apply.

1. Each port, except for the mirror port, must belong to at least one static VLAN. By default, a port is an untagged member of the default VLAN.
2. A port can be untagged for zero or one VLAN. A port that is untagged for a VLAN transmits frames destined for that VLAN without a VLAN tag in the Ethernet frame.
3. A port can be tagged for zero or more VLANs. A port that is tagged for a VLAN transmits frames destined for that VLAN with a VLAN tag, including the numerical VLAN Identifier of the VLAN.
4. A port cannot be untagged and tagged for the same VLAN.
5. The mirror port, if there is one, is not a member of any VLAN.

## Protected VLANs

If a VLAN is Protected, Layer 2 traffic between ports that are members of a Protected VLAN is blocked. Traffic can be Layer 3 switched to another VLAN. This feature prevents members of a Protected VLAN from communicating with each other yet still allows members to access another network. Layer 3 Routing between Ports in a Protected VLAN can be prevented by adding a Layer 3 filter. The Protected VLAN feature also allows all of the members of the Protected VLAN to be in the same subnet.

A typical application is a hotel installation where each room has a port that can be used to access the Internet. In this situation it is undesirable to allow communication between rooms.

To create a Protected VLAN, use the command:

```
CREATE VLAN=vlan-name VID=2..255 [PROTECTED]
```

## VLAN Interaction with STPs and Trunk Groups

Each VLAN and port can only belong to one Spanning Tree entity (STP). A port cannot be added to a VLAN that is in a different STP from the VLANs to which the port already belongs, with one exception. The exception is that an untagged port in the default VLAN can be moved from the default VLAN to any other VLAN in any STP, if the port belongs only to the default VLAN as an untagged port.

All the ports in a trunk group must have the same VLAN configuration: they must belong to the same VLANs and have the same tagging status, and can only be operated on as a group.

## Generic VLAN Registration Protocol (GVRP)

---

The GARP application GVRP allows routers in a network to dynamically share VLAN membership information, to reduce the need for statically configuring all VLAN membership changes on all switches in a network. See the *Generic Attribute Registration Protocol (GARP)* chapter in the *AT-8700XL Series Switch Software Reference*.

## Quality of Service

---

Quality of Service (QoS) enables you to prioritise traffic and/or limit the bandwidth available to it. The concept of QoS is a departure from the original networking protocols, which treated all traffic on the Internet or within a LAN the same. Without QoS, every different traffic type is equally likely to be dropped if a link becomes oversubscribed. This approach is now inadequate in many networks, because traffic levels have increased and networks transport time-critical applications such as streams of video data. QoS also enables service providers to easily supply different customers with different amounts of bandwidth.

Configuring Quality of Service involves two separate stages:

1. Classifying traffic into flows, according to a wide range of criteria.

Classification is performed by the switch's packet classifier and is not described in this chapter, but in the *Classifier* chapter in the *AT-8700XL Series Switch Software Reference*.

2. Acting on these traffic flows.

Approaches, methods and commands for this are described in the *Quality of Service* chapter in the *AT-8700XL Series Switch Software Reference*.

## Spanning Tree Protocol (STP)

---

The Spanning Tree Protocol (STP) makes it possible to automatically disable redundant paths in a network to avoid loops, and enable them when a fault in the network means they are needed to keep traffic flowing. A sequence of LANs and switches may be connected together in an arbitrary physical topology resulting in more than one path between any two switches. If a loop exists, frames transmitted onto the extended LAN would circulate around the loop indefinitely, decreasing the performance of the extended LAN. On the other hand, multiple paths through the extended LAN provide the opportunity for redundancy and backup in the event of a bridge experiencing a fatal error condition.

The spanning tree algorithm ensures that the extended LAN contains no loops and that all LANs are connected by:

- Detecting the presence of loops and automatically computing a logical loop-free portion of the topology, called a *spanning tree*. The topology is dynamically pruned to a spanning tree by declaring the ports on a switch redundant, and placing the ports into a 'Blocking' state.
- Automatically recovering from a switch failure that would partition the extended LAN by reconfiguring the spanning tree to use redundant paths, if available.

## Spanning Tree and Rapid Spanning Tree Port States

If STP is running in STANDARD mode, then each port can be in one of five Spanning Tree states, and one of two switch states. If STP is running in RAPID mode, then each port can be in one of four states. The state of a switch port is taken into account by STP. To be involved in STP negotiations, STP must be enabled on the switch, the port must be enabled on the switch, and enabled for the STP it belongs to.

## Interfaces to Layer 3 Protocols

---

Interfaces can be configured to VLANs for IP routing protocols in the same way that other interfaces are created for other interface types. Concatenate VLAN with the VID of the VLAN giving VLAN*n*, for instance:

```
INTERFACE=VLAN3
```

## IGMP Snooping

---

IGMP (*Internet Group Management Protocol*) is used by IP hosts to report their multicast group memberships to routers and switches. IP hosts join a multicast group to receive broadcast messages directed to the multicast group address. IGMP is an IP-based protocol and uses IP addresses to identify both the multicast groups and the host members. For a VLAN-aware devices, this means multicast group membership is on a per-VLAN basis. If at least one port in the VLAN is a member of a multicast group, by default multicast packets will be flooded onto all ports in the VLAN.

*IGMP snooping* enables the switch to forward multicast traffic intelligently on the switch. The switch listens to IGMP membership reports, queries and leave messages to identify the switch ports that are members of multicast groups. Multicast traffic will only be forwarded to ports identified as members of the specific multicast group.

IGMP snooping is performed at Layer 2 on VLAN interfaces automatically. By default, the switch will only forward traffic out those ports with multicast listeners, therefore it will not act as a simple hub and flood all multicast traffic out all ports. IGMP snooping is independent of the IGMP and Layer 3 configuration, so an IP interface does not have to be attached to the VLAN, and IGMP does not have to be enabled or configured.

IGMP snooping is enabled by default. To disable it, use the command:

```
DISABLE IGMP Snooping
```

## Triggers

The Trigger Facility can be used to automatically run specified command scripts when particular triggers are activated. When a trigger is activated by an event, global parameters and parameters specific to the event are passed to the script that is run. For a full description of the Trigger Facility, see the *Trigger Facility* chapter in the *AT-8700XL Series Software Reference*.

The switch can generate triggers to activate scripts when a fibre uplink port loses or gains coherent light. To create or modify a switch trigger, use the commands:

```
CREATE TRIGGER=trigger-id MODULE=SWITCH
  EVENT={LIGHTOFF|LIGHTON} PORT=port [AFTER=hh:mm]
  [BEFORE=hh:mm] [DATE=date|DAYS=day-list] [NAME=name]
  [REPEAT={YES|NO|ONCE|FOREVER|count}] [SCRIPT=filename...]
  [STATE={ENABLED|DISABLED}] [TEST={YES|NO|ON|OFF}]

SET TRIGGER=trigger-id PORTS={port-list|ALL} [AFTER=hh:mm]
  [BEFORE=hh:mm] [DATE=date|DAYS=day-list] [NAME=name]
  [REPEAT={YES|NO|ONCE|FOREVER|count}]
  [TEST={YES|NO|ON|OFF}]
```

The following sections list the events that may be specified for the EVENT parameter, the parameters that may be specified as *module-specific-parameters*, and the arguments passed to the script activated by the trigger.

<b>Event</b>	LINKDOWN
<b>Description</b>	The port link specified by the PORT parameter has just gone down.
<b>Parameters</b>	The following command parameter(s) must be specified in the CREATE/SET TRIGGER commands:
Parameter	Description
PORT= <i>port</i>	The port on which the event will activate the trigger.
<b>Script Parameters</b>	The trigger passes the following parameter(s) to the script:
Argument	Description
%1	The port number of the port which has just gone down.
<b>Event</b>	LINKUP
<b>Description</b>	The port link specified by the PORT parameter has just come up.
<b>Parameters</b>	The following command parameter(s) must be specified in the CREATE/SET TRIGGER commands:
Parameter	Description
PORT= <i>port</i>	The port on which the event will activate the trigger.
<b>Script Parameters</b>	The trigger passes the following parameter(s) to the script:
Argument	Description
%1	The port number of the port which has just come up.



## Chapter 5

# Maintenance and Troubleshooting

## This Chapter

---

If you are familiar with networking and switch operations, you may be able to diagnose and solve some problems yourself.

This chapter gives tips on how to:

- start your switch (see *“How the Switch Starts Up”* on page 33).
- avoid problems (see *“How to Avoid Problems”* on page 35).
- reconfigure your switch if you accidentally clear the FLASH memory (see *“What to do if you clear FLASH memory completely”* on page 36).
- reset passwords if they are lost (see *“What to do if Passwords are Lost”* on page 37).
- gather information from your switch that support personnel need to provide accurate support tailored to your situation (see *“Getting the Most Out of Technical Support”* on page 37).
- troubleshoot problems with DHCP IP addresses if the switch is acting as a client or as a server (see *“Troubleshooting DHCP IP Addresses”* on page 38).
- restart the switch at any time with no configuration (see *“Resetting Switch Defaults”* on page 39).

Information gained from the LEDs on the front panel of the switch is described in the *AT-8700XL Series Hardware Reference*.

## How the Switch Starts Up

---

The sequence of operations that the switch performs when it boots are:

1. Perform startup self tests.
2. Perform the install override option.
3. Load the EPROM release as the INSTALL boot.
4. Inspect and check INSTALL information.
5. Load the required EPROM or FLASH release as the main boot.
6. Start the switch.
7. Execute the boot script, if one has been configured.

If a terminal is connected to *asyn0*, a series of status and progress messages similar to those shown in Figure 1 on page 34 are displayed during the startup process.

**Figure 1: switch startup messages.**

```
INFO: Self tests beginning.
INFO: RAM test beginning.
PASS: RAM test, 4096k bytes found.
INFO: BBR tests beginning.
PASS: BBR test, 128k bytes found.
PASS: BBR test. Battery OK.
INFO: Self tests complete
INFO: Downloading router software.
Force EPROM download (Y) ?
INFO: Initial download succeeded
INFO: Executing configuration script <boot.cfg>
INFO: Router startup complete

Manager >
```

The startup self tests check the basic operation of the switch. If your switch passes these tests the switch should be able to at least proceed far enough to perform the load of the EPROM release and to start operating.

The install override option is designed to allow a mandatory switch boot from the EPROM release. The message:

```
Force EPROM download (Y)?
```

is displayed on the terminal connected to *asyn0* and the switch pauses. If you do not press a key within a few seconds, the startup process will continue and all steps in the sequence are executed. If the [Y], [S] or [Ctrl/D] key on the terminal are pressed immediately after the message is displayed, you can alter the switch startup process (Table 3 on page 34).

**Table 3: switch startup sequence keystrokes.**

Pressing key...	Forces the switch to...
Y	Load the EPROM release, with no patch, and skip straight to step 6.
S	Start with the default configuration. Any boot script configuration is ignored.
[Ctrl/D]	Enter diagnostics mode.

When you start the switch the EPROM release is always loaded first. The EPROM release contains all the code required to obtain and check the INSTALL information. This first boot is known as the INSTALL boot. The INSTALL information is inspected and the switch is setup to perform another load. Even if the actual release required is the EPROM release, another load is always performed. At this point, if a patch load is required, it is also performed.

The switch startup occurs immediately after the install override option, or after the INSTALL information check. The INSTALL information check performs a full startup of switch software and initiates the normal operation of the switch.

Finally, if there is a defined boot script, this script is executed.

## How to Avoid Problems

---

If you perform the following procedures you may help reduce the likelihood and impact of some future switch events.

### Set system territory

Set the system territory to the country or region in which the switch is connected to the network. Some protocols are implemented differently in some countries. To ensure that the switch uses variants that will work in the country your switch is routing in, enter the command:

```
SET SYSTEM TERRITORY={AUSTRALIA|CHINA|EUROPE|JAPAN|KOREA|  
NEWZEALAND|USA}
```

### Backup software files

Store a backup of the current switch software. If the switch software is accidentally cleared from the switch's FLASH memory, you will need to reload the software release and patch files. If your access to the Internet is via the switch, then you will need the files on your LAN. You may wish to keep a copy of the current software and patch files on a TFTP server on your network. You can download switch software from the support site at

<http://www.alliedtelesyn.co.nz/support/at8700xl>.

### Backup configuration script

Store a backup of the latest configuration script, in case the configuration file on the switch is accidentally deleted or damaged.

### Backup switch

If your network has many switches, you may wish to keep a backup switch ready to replace any switch that malfunctions. When you upgrade the software release or patch on the other switches in the network, upgrade the backup too. Store on it one current config script for each switch in your network, so that when it is needed, you need only set the configuration file with which it boots to match the switch it replaces.

### Configure logging

The logging facility stores log messages for events with a specified severity in a log file. You can change the size of the log file, and the kind of messages recorded. You can configure the switch to output log messages in several ways, including to a remote switch with a specified IP address, or as an email to a particular email address. The switch can also receive log messages from another switch. Set the Logging Facility to log and forward the log messages you need to monitor your network (see the *Logging Facility* chapter in the *AT-8700XL Switch Software Reference*). Inspect the log file from time to time, and if difficulties arise.

## FLASH compaction

If the FLASH memory gets filled beyond a certain level, it will automatically activate FLASH compaction to recover any space that is made available from deleted files. You can also activate FLASH compaction manually if required.



---

*While FLASH is compacting, do not restart the switch or use any commands that affect the FLASH file subsystem. Do not restart the switch, or create, edit, load, rename or delete any files until a message confirms that FLASH file compaction is completed. Interrupting flash compaction may result in damage to files. Damaged files are likely to prevent the switch from operating correctly.*

---

## Watch for software updates

From time to time patches may be released to improve the function of your switch software, and new software releases make new features available.

Watch for patches and new software releases on the support site at

<http://www.alliedtelesyn.co.nz/support/at8700xl>.

## What to do if you clear FLASH memory completely



---

*DO NOT clear the FLASH memory completely. The software release files are stored in FLASH, and clearing it would leave no software to run the switch.*

---

If you accidentally do this, you will need to:

1. **Boot with default configuration.**

Reboot the switch from a terminal connected the asynchronous terminal port (not Telnet). Use the install override to run the default configuration (see “How the Switch Starts Up”).

2. **Log in.**

Log in to the switch using the default password *friend* for the *manager* account.

3. **Put current software release on server.**

Make sure you have the current software release and patch files on a server connected to the switch by the switch port or Ethernet port. Current software release and patch files are downloaded from the support site at <http://www.alliedtelesyn.co.nz/support/at8700xl>.

4. **Assign an IP address.**

Assign an IP address to the switch interface over which the software files are downloaded.

5. **Load software files onto switch.**

Load the required software and patch onto the switch (see “Loading Releases and Patches into the Switch” on page 17).

## 6. Set the install information.

Set the switch to use the software installed (see “Upgrading Switch Software”).

## 7. Reconfigure the switch.

If you have a copy of the recent configuration file stored on your network, you can download this onto the switch too. Otherwise you will need to re-enter all configuration.



***While FLASH is compacting, do not restart the switch or use any commands that affect the FLASH file subsystem. Do not restart the switch, or create, edit, load, rename or delete any files until a message confirms that FLASH file compaction is completed. Interrupting flash compaction may result in damage to files. Damaged files are likely to prevent the switch from operating correctly.***

If you accidentally restart the switch, or use any commands that affect the FLASH file subsystem, contact your authorised distributor or reseller. You may have to return the switch to the factory.

# What to do if Passwords are Lost

If a user forgets their password, to reset the password from an account with MANAGER privilege, enter the command:

```
SET USER=login-name PASSWORD=password
```

You can reset passwords for accounts with MANAGER privilege with the same command, provided the manager can login to at least one account with MANAGER privilege.

If you require further assistance contact your authorised distributor or reseller.

# Getting the Most Out of Technical Support

For online support for your switch, see our on-line support page at <http://www.alliedtelesyn.co.nz/support/at8700xl>.

If you require further assistance, contact your authorised distributor or reseller. Gather as much of the following information from your switch and network as you can. This gives the support personnel as much information as possible to diagnose and solve your problem. They may ask you to send the information to them by email.

Gather this information:

- Your name, organisation and contact details.
- What is the make and model of your switch?

```
SHOW SYSTEM
```

- Which software release and patch files is your switch running? For example, 87-251.rez. Enter the command:

```
SHOW INSTALL
```

- What software configuration is currently running? Enter the command:

```
SHOW CONF DYN
```

- How is the switch connected to your network? A diagram showing the physical configuration of the network your switch is operating in may be useful.

- To get debugging output, enter the command:

```
SHOW DEBUG
```

- Depending on the problem, the support personnel may also ask you for the output from the following commands (see the *Monitoring and Fault Diagnosis* section in the *Operations* chapter, *AT-8700XL Switch Software Reference*):

```
SHOW EXCEPTION
```

```
SHOW STARTUP
```

```
SHOW LOG
```

```
SHOW CPU
```

```
SHOW BUFFER
```

## Troubleshooting DHCP IP Addresses

---

### Your switch is acting as a DHCP client

If your switch is acting as a DHCP client the router should receive its IP address dynamically. If your switch is not receiving an IP address, check that the domain name and host name are correct.

### Your switch is acting as a DHCP server

If your switch is not assigning IP addresses to a host, or hosts, on the subnet perform this procedure:

1. Reboot the host machine, to force it to re-request IP settings.
2. Check the host's TCP/IP settings.

In Microsoft® Windows™ 95/98, click **Settings** → **Control Panel** → **Network**. Select **TCP/IP** and click **Properties**. Click **Obtain an IP address automatically**.

In Microsoft® Windows™ 2000, click **Settings** → **Control Panel** → **Network and Dial-up Connections** → **Local Area Connection** → **Properties**. Select **Internet connection (TCP/IP)** and click **Properties**. Click **Obtain an IP address automatically**.

3. Check that the DHCP server has a large enough range of addresses. To assign a range, enter the command:

```
CREATE DHCP RANGE
```

---

## Resetting Switch Defaults

---

To restart the switch at any time with no configuration, enter the command:

```
RESTART ROUTER CONFIG=NONE
```

If `boot.cfg` has changed, to set it back to the default configuration by saving the default dynamic configuration to the `boot.cfg` file, enter the command:

```
CREATE CONFIG=boot.cfg
```

To set the switch to restart with the boot configuration file, enter the command:

```
SET CONFIG=boot.cfg
```



---

***DO NOT clear the FLASH memory completely. The software release files are stored in FLASH, and clearing it would leave no software to run the switch.***

---

